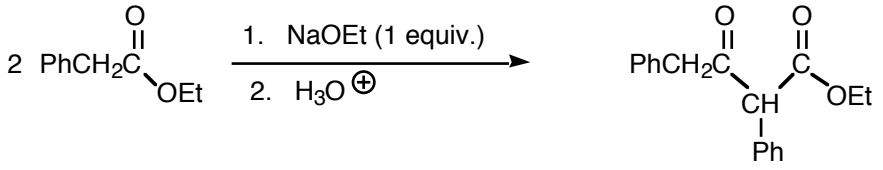
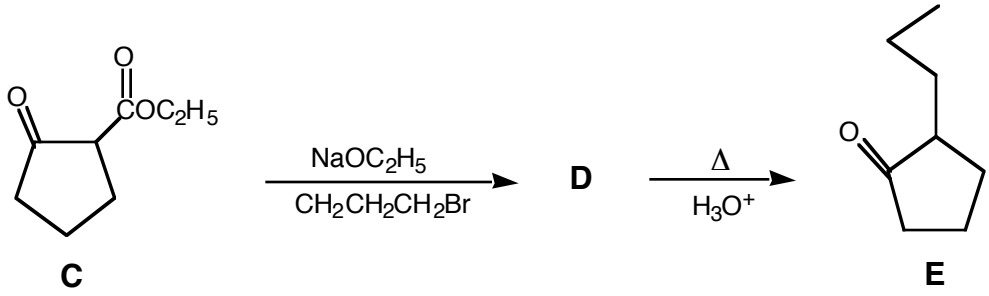
Names: _____
Chem 227/ Dr. Rusay

Enolate Chemistry Continued
Synthesis and Reactions of β-Dicarbonyl Compounds

1. Give a reasonable mechanism for the following reaction, clearly showing all important intermediates and resonance structures. Use curved arrows to show the movement of electron pairs.

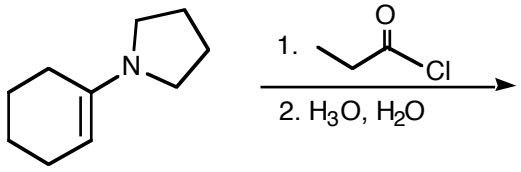


2. When compound **C** in ethanol is stirred with one molar equivalent of $NaOC_2H_5$ and one equivalent of $CH_3CH_2CH_2Br$, a new compound **D** is formed. When **D** is refluxed with 3M H_2SO_4, the ketone **E** is formed. Propose a structure for **D**, and give a stepwise electron-pushing mechanism leading from **C** to **D** to **E**.

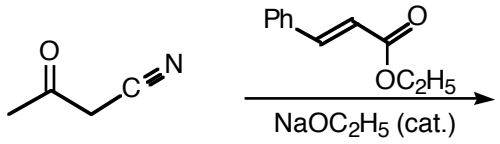


C **E**

3. Provide structures for the major products of each of the following reactions. In each case, circle the nucleophile in the carbon-carbon bond-forming steps.

a. 

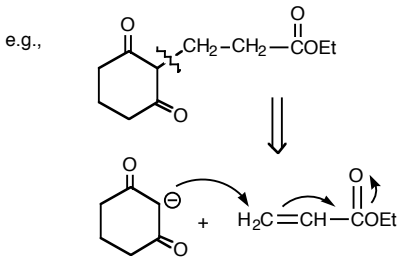
b. $PhCH + CH_3CCH_2CO_2Et \xrightarrow[EtOH]{Et_2NH}$

c. 

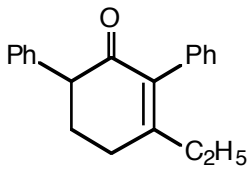
$(C_{15}H_{17}NO_3)$

d. $CH_3CH_2CO_2Et \xrightarrow[2\ \ CH_3CH_2I]{1\ \ (Me_2CH)_2N^{\ominus}Li^{\oplus}}$

3. Disconnect the following compounds into components that would condense (assemble) to give the designated compounds. Use the electron-pushing formalism to show the condensation steps.

e.g., 

a. $C_6H_5CCH_2COEt$

b. 

c. $CH_3CCHCH_2CH{=}CH_2$ (with CH_3 branch)

4. Having available ethyl acetoacetate, diethyl malonate, benzene, any compounds with three carbons or fewer, and any inorganic reagents, show how to synthesize the following compounds.